Smartgen®

HAT270A ATS (Automatic Transfer Switch) Controller

USER MANUAL

Smartgen

Smartgen Technology

众智电子 **Chinese trademark**

Smartgen **English trademark**

Smartgen — make your generator ***smart***

Smartgen Technology Co., Ltd
No. 28 Jinsuo Road
Zhengzhou
Henan Province
P. R. China

Tel: +86-371-67988888/67981888

+86-371-67991553/67992951/67992952

+86-371-67981000(overseas)

Fax: 0086-371-67992952

Web: http://www.smartgen.com.cn

http://www.smartgen.cn

Email: sales@smartgen.com.cn

All rights reserved. No part of this publication may be reproduced in any material form (including photocopying or storing in any medium by electronic means or other) without the written permission of the copyright holder.
Smartgen Technology reserves the right to change the contents of this document without prior notice.

Software Version

Version	Date	Note
1.0	2010-04-02	Original release.
1.1	2011-05-20	Modify Typical Application and operation procedures of the controller panel.

SmartGen

CONTENT

1 SUMMARY 4

2 PERFORMANCE AND CHARACTERISTICS 4

3 SPECIFICATION 5

4 PANEL DESCRIPTION 6

5 PANEL OPERATION AND CONNECTIONS 6

5.1 Delay Adjustment 6

5.2 Control Setting 6

6 AC VALID OPTION 8

7 PROGRAMMED PARAMETER AND RANGE 9

8 TERMINALS DESCRIPTION 9

9 TYPICAL APPLICATION 10

10 CASE DIMENSIONS 13

11 FAULT FINDING 13

SmartGen

1 SUMMARY

HAT270A ATS controller using microprocessor as its core can precisely monitor 2-way 3 phase voltage, make accurate judgment on abnormal voltage (loss of power, over voltage, under voltage, lack of phase) and control ATS to transfer after delay. When #1 power is abnormal, the controller will send signal to start genset. HAT270A controller is suitable for controlling SOCOMEC VS, VE, ATyS3, ATySM3s model and other ATS switches of similar function.

2 PERFORMANCE AND CHARACTERISTICS

HAT270A controller can monitor 2-way 3 phase voltage (2 way mains and 2 way gens, or 1 way mains and 1 way gens) and control ATS to transfer. Its performance and characteristics are shown as below:

- Realized computer programming control; can use computer to set voltage abnormal delay and genset stop delay, switch priority, correct voltage value and other functions with overall graphical interface operation. When programming with computer, the front panel must be opened, then use SG72 interface module (USB to LINK) to program via the PC test software. Please refer to “HAT270A Test Software Manual” for more information about PC software.
- Power supply of the device is A phase and N phase of #I and #II power supply.
- Normal delay #I power supply or #II power supply can be set in (0~60) seconds. Genset start delay can be set in (0~60) seconds.
- Abnormal delay of #I power supply or #II power supply can be set in (0~60) seconds. Genset stop delay can be set in (0~60) seconds.
- “#I Priority”, “Auto/Manual”, “No Priority” and “#II Priority” can be set through panel knobs to ensure “#I Power Priority”, “#II Power Priority” or “No Priority” and maintenance;
- Isolated design of 2-way Neutral;
- With forced breaking input. When the input port is enabled, ATS will automatically transfer to Breaking (OFF) Position;
- LED can clearly display working status of switch;
- With dual power supply conversion circuit, LO, NO output (5A 250V AC) can be applied directly as the power supply for ATS;
- Output contact capacity of start relay(GENS START) is 7A/28VDC, passive N/C contact;
- Controller has strong ability of anti-electromagnetic interference, can be used under complex electromagnetic interference environment;
- Modular configuration design, flame-resisting ABS plastic shell, inserted type

SmartGen

terminals connection with compact structure and easy installation.

3 SPECIFICATION

- Power supply input

  AC power supply: AC230V±20% (50 Hz/60Hz) (from A phase and N phase of #I and #II)

  Measured voltage: rated 380V 50 Hz/60Hz 3 phase 4 wire, and other measured voltage class, please consult before ordering.

- Range of abnormal power

  Over Voltage threshold: 264V (only be set via PC).

  Under Voltage threshold: 172V (only be set via PC).

- Action time

  Closing time: 5 seconds. During this period, if detected close signal is enabled, immediately disconnect.

  Opening time: 3 seconds. During this period, if detected close signal is disabled, immediately disconnect.

  Voltage normal delay: (0~60) seconds (adjusted via panel potentiometer).

  Voltage abnormal delay: (0~60) seconds, default: 5 seconds (adjusted via panel potentiometer).

  Genset start delay: when #I abnormal is confirmed, delay begins, (0~60) seconds, (adjusted via panel potentiometer)

  Genset stop delay: when #I normal is confirmed, delay begins (0~60) seconds, (adjusted via panel potentiometer).

- #I/#II closing monitoring (can be programmed via panel keys)

  Default: detect #I/#II closing status, and the controller must access the closing status signal.

- Power consumption

  When module is in rated voltage, power consumption of voltage circuit is not more than 2VA.

- Environment conditions

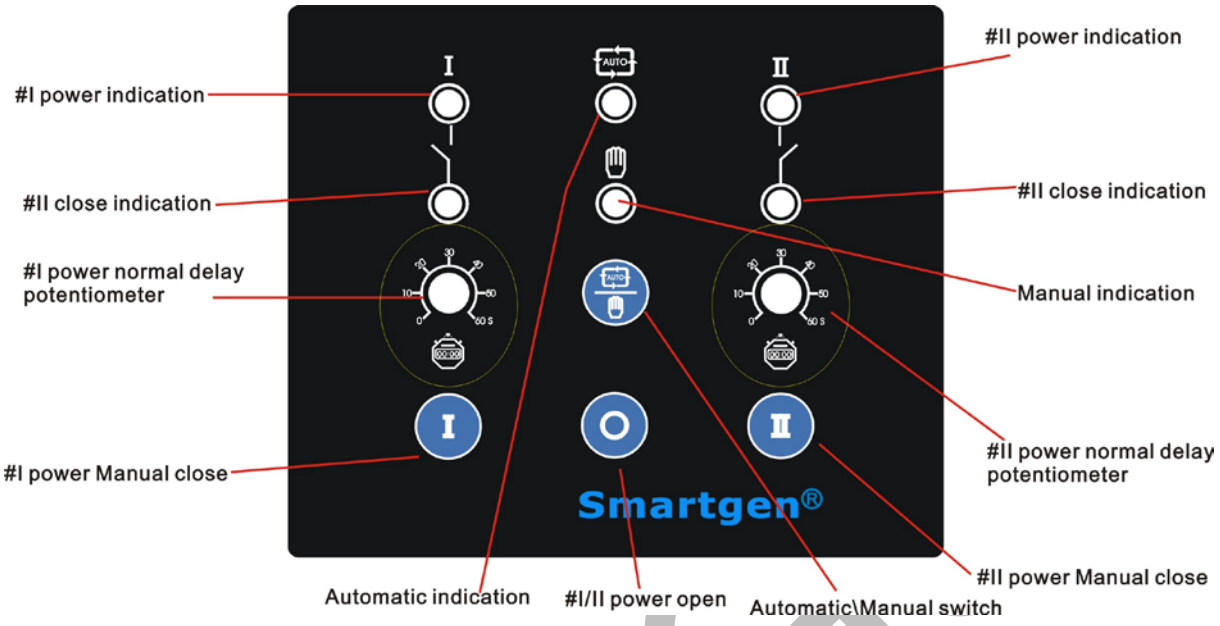
  Temperature: (-30~+70)ºC Humidity: (20~95)%

- Weight

  Net weight: 0.47Kg

SmartGen

4 PANEL DESCRIPTION



5 PANEL OPERATION AND CONNECTIONS

5.1 Delay Adjustment

#I normal delay potentiometer: judgment time (0~60) seconds.

#II normal delay potentiometer: judgment time (0~60) seconds.

5.2 Control Setting

a) Automatic/ Manual Operation

When controller is running, pressing key can set the controller as Auto mode or Manual mode (via automatic and manual status indicator). In Manual mode, press key, load will be transferred to #I power supply; press key; load will be transferred to #II power supply.

b) #I/ Voltage Abnormal Delay, Start/Stop Delay, #I/#II Power Priority And Closing Status Detection

When controller is running, press and key simultaneously and hold. #I power indicator, automatic status indicator and #II power indicator are flashing, which means

the controller can be set. The setting procedures are as below:

<table>
<tr><td colspan="4">Pressing can circularly select the setting items. Different items have different flashing LED indicators on the panel. The setting the item as below:</td></tr>
<tr><td>Items</td><td>Indication</td><td>Description</td><td>Confirmation</td></tr>
<tr><td rowspan="3">#I/#II Power abnormal delay</td><td rowspan="3">#I power indicator flashes</td><td>#I power abnormal delay</td><td>After adjusting “#I power supply normal delay” potentiometer, press key, #I power indicator illuminates, which confirms the setting.
Set range: (0~60)s</td></tr>
<tr><td>#II power abnormal delay</td><td>After adjusting “#I power supply normal delay” potentiometer, press key, #I power indicator illuminates, which confirms the setting.
Set range: (0~60)s</td></tr>
<tr><td>Restore factory default</td><td>Press key, #I power indicator illuminates, which confirms the action.
Abnormal delay of #I and #II power supply is 5s by default.</td></tr>
<tr><td rowspan="3">start/stop delay</td><td rowspan="3">Automatic status indicator flashes</td><td>start delay</td><td>After adjusting “#I power supply normal delay” potentiometer, press key, automatic status indicator illuminates, which confirms the setting.
Set range: (0~60)s</td></tr>
<tr><td>stop delay</td><td>After adjusting “#II power supply normal delay” potentiometer, press key, automatic status indicator illuminates, which confirms the setting.
Set range: (0~60)s</td></tr>
<tr><td>Restore factory value</td><td>Press key, automatic status indicator illuminates, which confirms the setting.
Stop delay is 90s by default.</td></tr>
<tr><td>I/#II power priority(*1)</td><td>#II power indicator flashes</td><td>#I power supply priority</td><td>Press key, #II power supply indicator illuminates, and then #I power supply is main power to supply for the</td></tr>
</table>

SmartGen

			load.
		#II power supply priority	Press Ⅱ key, #II power supply indicator illuminates, and then #II power supply is main power to supply for the load.
		#I/#II power supply no priority	Press ○ key, #II power supply indicator illuminates; which means there is no priority supply for the load between #I and #II power supply.
Closing status of #I power **(*2)**	#I closing Indicator flashes	Not detect closing status	Press Ⅰ key, detection of #I and #II closing input is disabled.
		Detect closing status	Press Ⅱ key, detection of #I and #II closing input is enabled.

***1 Note:** Once the controller is power on, its priority can be judged by the following three conditions.

1) #I power supply indicator flashing rapidly for three times indicates #I power supply for priority transfer.

2) #II power supply indicator flashing rapidly for three times indicates #II power supply for priority transfer.

3) Both #I and #II power supply indicators flashing for three times indicates there is no priority transfer.

***2 Note:** Once the controller is power on, if #I and #II power supply indicators flash simultaneously, #I and #II closing input detection is enabled; if not, the detection is disabled.

Detect enabled: #I and #II closing status is judged by input status.

Detect disabled: #I and #II closing status is judged by closing/opening action and closing input is inactive.

After setting the parameters, press #I and #II closing keys simultaneously, all panel indicators will illuminate and then release the keys, the setting is completed.

6 AC OPTION

According to practice application, use can define the AC options.

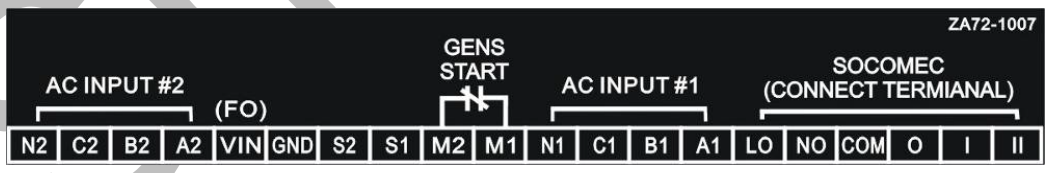
No.	Rule description	
1	Phase A must have voltage	Phase B, C cannot lack phase.
2		Phase B, C can lack one phase.
3		Phase B, C can lack two phase.
4	Phase A can have no voltage	3 phase can lack one phase.
5		3 phase can lack two phases.

SmartGen

7 PROGRAMMED PARAMETER AND RANGE

No.	Items	Range	Default	Notes
1	#I voltage normal delay	(0~60)s	Set via panel potentiometer	Set via panel potentiometer only
2	#II voltage normal delay	(0~60)s	Set via panel potentiometer	Set via panel potentiometer only
3	Genset start delay	(0~60)s	Set via panel potentiometer	Set via panel potentiometer only
4	#I voltage abnormal delay	(0~60)s	5s	Set via panel potentiometer only
5	#II voltage abnormal delay	(0~60)s	5s	Set via panel potentiometer only
6	Genset stop delay	(0~90)s	90s	Set via panel potentiometer only
7	Voltage upper limit	(50~300)V	264V	Set via PC only
8	Voltage lower limit	(50~300)V	172V	Set via PC only
9	Power priority	#I priority, #II priority, no priority	#I Priority	Set via panel potentiometer or PC
10	AC option	See “AC option” for details	3 phase cannot lack phase.	Set via PC only
11	Closing status detection		Enable	Set via panel potentiometer only

8 TERMINALS DESCRIPTION



- Terminals A1, B1, C1 and N1: Separately connect A, B, C and N of #I power.
- Terminals A2, B2, C2 and N2: Separately connect A, B, C and N of #II power.
- Terminal S1: Closing status input of #I power supply (dry contact input, grounding)
- Terminal S2: Closing status input of #II power supply (dry contact input, grounding)
- Terminal FO(VIN)：It is a multiplex port both for DC power positive and Forced Open input. Controller will automatically choose DC power input or Forced Open input. When this port is grounding, controller will execute forced open action.

SmartGen

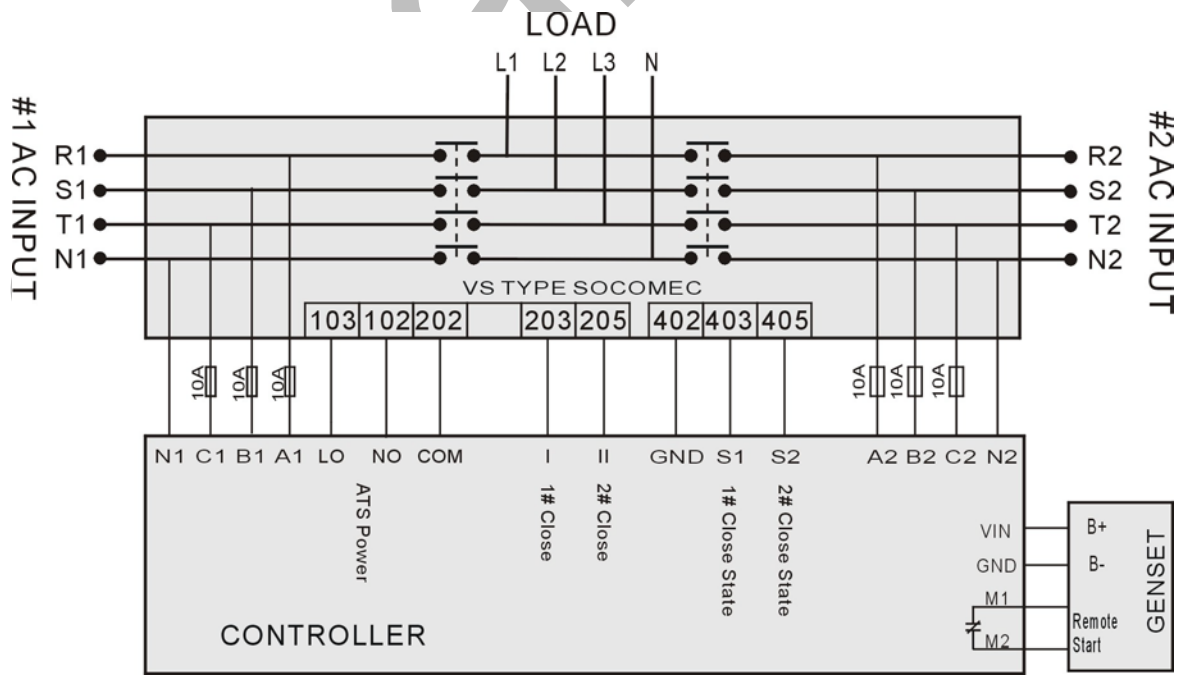
When connects DC power supply, grounding will result in short circuit. Only when DC power supply is disconnected can this port be grounding.

When this port is grounding, whether in manual mode or automatic mode, ATS will be switched to OFF position, both manual and automatic operations are disable. Forced Open is activated only for switches with OFF position like SOCOMEC VE type, ATyS3 type and ATySM3S type, but SOCOMEC VS type is invalid.

- Terminal GND: DC power cathode.
- Terminal M1, M2 (GENSET START): Genset start relay (N/C dry contact, capacity is 7A).
- Terminal LO, NO: It is the power supply for ATS. LO/NO separately comes from A and N phase of #I and #II power. When A phase and N phase of #I or #II power is normal, the two terminals will output power (capacity is 5A/250VAC).
- Terminal COM: SOCOMEC ATS closing and opening control.
- Terminal O: SOCOMEC ATS opening control (contact capacity is 3A/250VAC).
- Terminal I: SOCOMEC #I closing control (contact capacity is 3A/250VAC).
- Terminal II: SOCOMEC #II closing control (contactor capacity is 3A/250VAC).

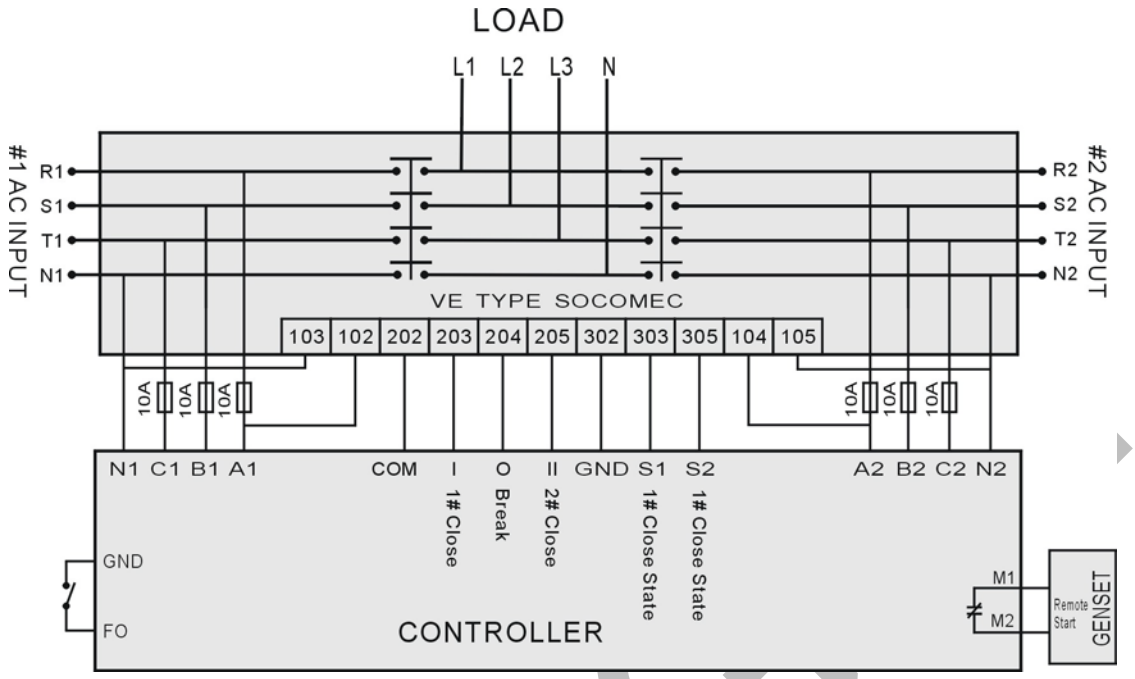
9 TYPICAL APPLICATION

SOCOMEC VS Type Switch

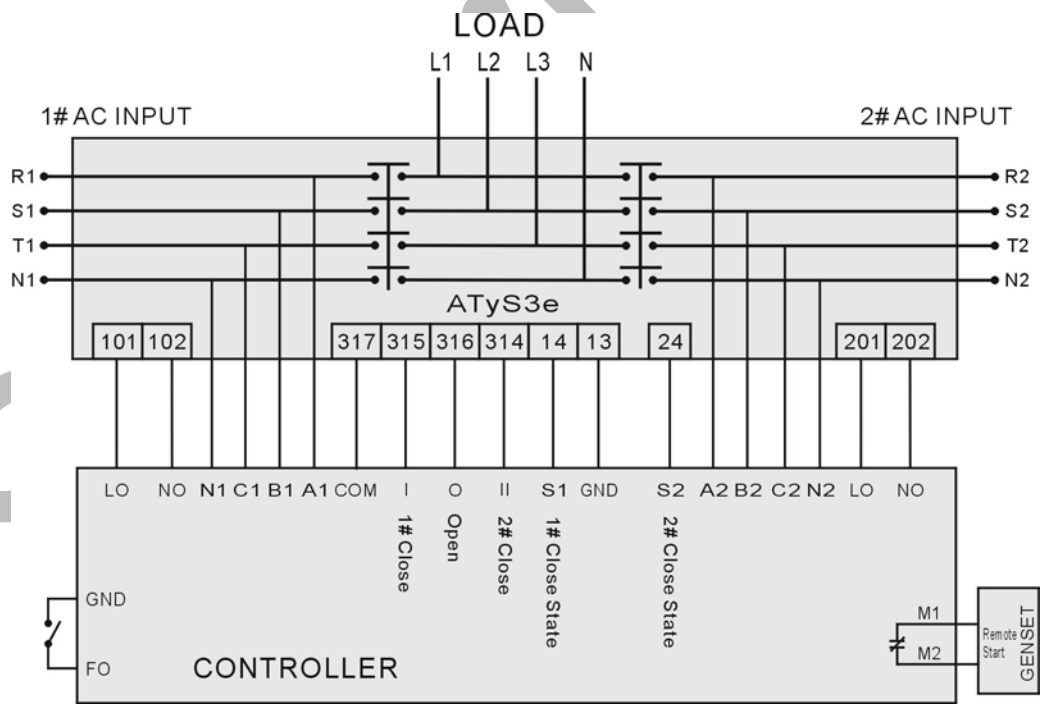


artGen

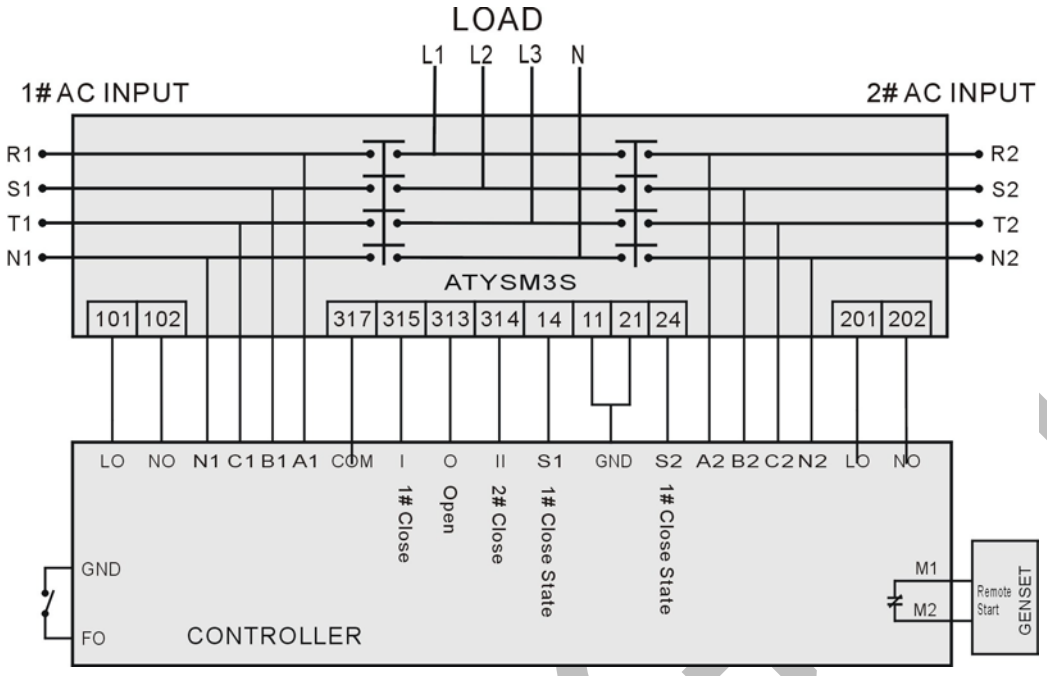
SOCOMEC VE Type Switch



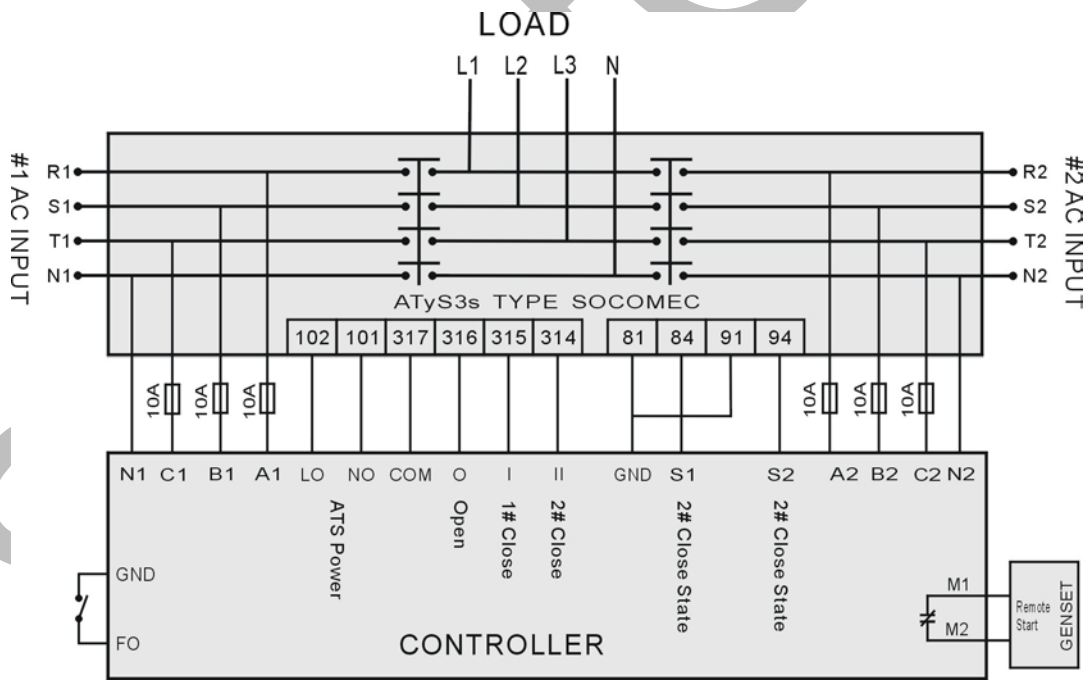
SOCOMEC ATyS3e Type Switch



SOCOMEC ATySM3s Type Switch



SOCOMEC ATyS3s Type Switch

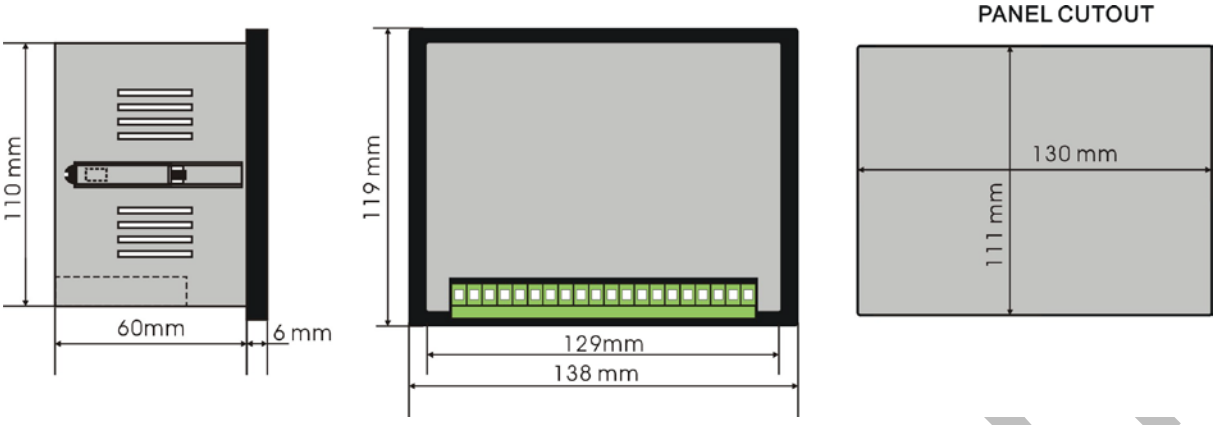


Note: 81, 84: #I closing N/O auxiliary contact of ATyS3s switch;

91, 94: #II closing N/O auxiliary contact of ATyS3s switch;

The SOCOMEC ATyS3s switch has not marked the closing auxiliary contact. Please refer to the wiring diagram for the specific position.

10 CASE DIMENSIONS



11 FAULT FINDING

Symptoms	Possible remedy
Controller inoperative	Check connections of #I and #II power; Check the fuse of #I and #II power.
Switch is not activated	Check ATS mechanism. Check the connection between ATS and controller.
#I or #II normal indicator flashes.	Check if 3-phase voltage is normal.(over/under voltage, lack of phase, including lack of neutral line)
In Auto mode, # I or # II normal indicator illuminates but cannot switch.	Set the controller as Manual Mode and see if it can switch. Check voltage normal delay, shorten the delay time. Check the connection between ATS and controller.
failed to start	Only when #I voltage is abnormal, controller will send start signal. Check start delay, shorten the delay time.

SmartGen